



Federal Aviation Administration  
Alaskan Region

Capstone Program Management Office  
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Anchorage Alaska 99501

# Capstone Quarterly Report

1<sup>st</sup> Quarter FY01

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October - December 2000

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## Capstone To Date

A new year has dawned on the Capstone Program with some exciting opportunities and advancements on the horizon. Likewise, CY2000 closed with some significant Capstone Phase I milestones having been achieved, not the least of which was the successful inaugural flight for “radar-like” services on January 1, 2001. Initial results of Capstone Phase I have identified a clear path of transition activities by identifying and addressing National Airspace System (NAS) implementation issues. Capstone’s system integration approach is validating the overall safety and efficiency benefits expected from modernization. During the past year, approximately 40,000 hours have been flown with Capstone's blend of communications, navigation, and surveillance equipment without a single controlled flight into terrain (CFIT) accident, the most prevalent Alaskan accident type.

For FY2001, the Capstone Program will continue its partnerships with the air carrier and avionics industries, and the traveling public. Work on elements supporting technologies chosen for Phase I (Ground Based Transceivers (GBT), Flight Information Services (FIS), etc.) need to be completed such that each piece is hardened, validated, and ready for further deployment throughout the NAS.

FY2001 activities will focus on completion of Phase I Capstone ground service area requirements in and around Bethel. Sixteen (16) non-precision approach procedures have been developed for 9 airports and with 1 additional airport to receive GPS approach procedures within the Capstone Phase I area. Micro-EARTS modifications have aided the data collection and validation process as controllers provide key safety services through use of Automatic Data Surveillance-

Broadcast (ADS-B Previous plans for a Bethel Air Traffic Control Tower display to increase controller situational awareness will be "revisited" during the validation phase.

The Capstone initiative is a visible program providing tangible benefits. Capstone is building an infrastructure consistent with NAS modernization plans and identifying the transition path for procedure development and technology implementation, while providing near term safety benefits.

### October:

- The Capstone Test and Evaluation Master Plan for ADS-B Radar-Like Services (TEMP), Version 4.0, outlining the activities for use of the Capstone ADS-B system for radar-like services in airspace in and around Bethel, Alaska was submitted on October 1<sup>st</sup>.
- The Federal Aviation Administration (FAA) and the Department of Defense (DoD) have agreed to a frequency allocation of 981 MHz for the Capstone Universal Access Transceiver (UAT) datalink. The agreement allows DoD to operate its Joint Tactical Information Distribution (JTIDS) outside of Military Operating Areas (MOAS) with constraints. A shift from the currently assigned 966 MHz for ADS-B service is necessary to provide a protected frequency suitable for Instrument Flight Rules (IFR) applications. The agreement allows Capstone to use 981 MHz throughout Alaska until December 31, 2001 and must be renewed annually.
- The Capstone system was demonstrated in Europe by the MITRE Corp. at the Eurocontrol Experimental Center (EEC) in Bretigny, France. MITRE was invited

to provide an overview briefing on Capstone to the European ATM Programme Surveillance Team. Capstone avionics suites were installed in a Metroliner and a Cessna Citation 550 by UPS Aviation Technologies personnel to allow for airborne and ground data transmission recordings to be made for analysis. EEC is working toward a datalink decision in mid-2001. A ground vehicle ADS-B unit was also displayed during a symposium at EEC.

- A Capstone briefing and simulator demonstration was provided at the British Columbia Aviation Council's Annual Conference in Whistler, Canada. Great interest was shown by officials from Transport Canada, NAV Canada and the Canadian air transportation industry.
- The FY 2001 budget allocation for the Capstone Program from Congress amounted to \$12.2M. This included \$5M identified by Congress "to extend the Capstone program in Southeastern Alaska including communications upgrades". The Senate Appropriations Committee had earlier reported, "The Committee is encouraged by initial reports of the progress of the Safe Flight initiative and commends the FAA for the approach and focus of their effort in this area".
- A Bethel Capstone Safety Working Group meeting was held on October 4<sup>th</sup>. Plans are to develop a local procedures handbook specifically addressing Bethel airport concerns.
- Linda Bender, ATP-110, and Marcus Brown, ATP-120, arrived to help develop enroute and terminal air traffic control procedures for IFR Capstone ADS-B service in non-radar airspace

beginning on January 1, 2001. They visited Bethel to experience the Capstone Y-K Delta airspace and typical flight operations firsthand.

- The thirty-day period for collection of Micro-EARTS Automatic Dependent Surveillance-Broadcast (ADS-B) data at Anchorage ARTCC under the AUA-650, Capstone ADS-B Evaluation Plan ended on October 31<sup>st</sup>. Data analysis was conducted by the Oceanic/Offshore Integrated Product Team, AUA-600, under their "Capstone ADS-B Evaluation Plan" dated 10/2/00 to validate that the software is processing ADS-B and radar information properly. The AUA analysis was provided to the Flight Technologies and Procedures Division, AFS-400, to further determine if the data meets the criteria established in the Test Plan supporting the use of ADS-B position information at Anchorage ARTCC for aircraft separation services in non-radar airspace. In their Memorandum dated November 30<sup>th</sup> describing the results from this evaluation, it was stated that "...the ADS-B reported positions displayed to the air traffic controller appear to be as good as or better than the Anchorage radar data...".
- Capstone representatives participated in the Safe Flight 21, Ohio River Valley OpEval-2 Demonstration in Louisville, Kentucky. Much of the technology for Safe Flight 21 mirrors that for Capstone but with emphasis by the Cargo Airlines Association for their operational requirements.
- Capstone avionics equipment was demonstrated at the FAA booth for the Alaska Federation of Natives Job Fair in Anchorage on October 18<sup>th</sup> as well as to the Russian-American Advisory Group on Air Traffic on October 23<sup>rd</sup>.

- Seven (7) aircraft were equipped with Capstone avionics this month for a total of 68 installed aircraft to date.

## **November:**

- A local Memorandum of Understanding (MOU) between the National Air Traffic Controllers Association (NATCA) and the FAA was signed on November 7<sup>th</sup>. The agreement covers the evaluation phase of the Capstone program at the Anchorage ARTCC.
- NAV Canada and Transport Canada requested a Capstone briefing for their spring meeting in Winnipeg. They are considering a potential application of ADS-B in northern Manitoba which includes 22 aboriginal villages.
- The Bethel Capstone Working Group met on November 8<sup>th</sup>. Larry Speelman, Program Manager and Mike Falzone, Service Representative from UPS Aviation Technologies provided a briefing on the causes of equipment failures that have been experienced. Karla Shaw, AAL-059A, reported that some operators are not returning MX-20 data cards for reuse as required. These cards are subsequently recycled through Jeppesen so it is important for operators to abide by the established arrangements.
- Airway Facilities representatives traveled to Cape Romanzof on November 27<sup>th</sup> to work on the Ground Broadcast Transceiver (GBT). Hugh Barber, AAL-470HB, indicates remote maintenance monitoring (RMM) will begin to be addressed on January 2, 2001, following implementation of IFR services in Bethel
- Capstone representatives met with regional and national Flight Standards

personnel and air carrier representatives in Anchorage on November 14-15 to develop pilot procedures for the use of ADS-B in a non-radar environment. The group successfully developed a process that dovetails with air traffic control procedures in preparation for the January 1, 2001 kickoff of IFR services using ADS-B.

- The Capstone Program Office received two simulators from UPS-AT to assist with the numerous briefings and demonstrations we provide. This will also provide another simulator to the University of Alaska, Anchorage Capstone Training Office, giving them a total of five units for user training. These devices are equipped with an UAT port to allow for the broadcast and reception of ADS-B information with the use of external antennas as well as a video port for the connection to a projector.
- Representatives from the Sensis Corporation visited the Capstone Program Office and the Anchorage ARTCC to provide information concerning multilateration technology. A Sensis multilateration system was used in the Louisville Safe Flight 21 operational demonstration and another is being used in the Dallas-Fort Worth demonstration. Multilateration is a solution in a terminal environment to identify mixed equipped aircraft such as Mode S, Mode C, and ADS-B.
- John Hallinan, Capstone Program Manager and other Capstone team members traveled to Juneau to continue interviews with air carriers, pilots, and other aviation interests to determine the most important features to be included in a Capstone ADS-B system installed in Southeast Alaska as well as locations for potential ground equipment installations.

- A team from the FAA/ATQ, Office of Independent Operational Test and Evaluation (IOT&E) visited Anchorage for a preliminary review of activities and documentation leading to the Capstone system's delivery of radar-like air traffic control services in non-radar airspace on January 1, 2001. A routine IOT&E evaluation will be conducted next spring after services have been delivered for a period of time. The team also visited the Anchorage ARTCC and Bethel.
- A concern was raised that some Capstone "loaner" avionics have apparently been installed without proper entry of the aircraft's ICAO address. This "confuses" MicroEARTS software and we will be cautioning users to ensure the correct entry is made and periodically verified.
- An FAA-ATS Mission Analysis Integrated Requirements Team (IRT) arrived to gather requirements data for consolidation and submission in a report requested in response to headquarters' recognition of the Capstone system as a major component of the future Alaskan NAS. The report is intended to identify and prioritize all regional needs as expressed by the various FAA organizations.
- On November 22<sup>nd</sup>, we submitted to the National Runway Safety Program Office a proposal for an Alaskan Region Runway Safety Demonstration in FY2001. The proposal involves equipping airport surface vehicles with ADS-B transmitters, installing multilateration systems, implementing traffic information service-broadcast (TIS-B), and installing runway occupancy alerting software for pilot and controller advisories.
- The Capstone Program Office returned 45 Universal Access Transceivers (UAT's) to UPS Aviation Technologies for conversion to the protected 981MHz frequency assignment. This is a simple "swap-out" in the user's aircraft with the present 966MHz UAT, a simple software reconfiguration and a maintenance record entry for the amended Supplemental Type Certificate (STC).
- An STC has been issued for the installation Capstone avionics in DC-6 aircraft. These aircraft are significant to the Capstone Program since they are flown IFR from Anchorage daily on routine missions to many village airports in the study area.
- Capstone Ground Broadcast Transceivers (GBTs) using 981MHz were evaluated at the William J. Hughes Technical Center and passed integration testing followed by testing at the Anchorage ARTCC by Airway Facilities.
- From November 28 –30, the Air Traffic Services (ATS) Readiness Review Team visited the Anchorage ARTCC and the University of Alaska, Anchorage to review preparations for Capstone's transition on January 1, 2001, to providing IFR services in non-radar airspace. The emphasis of the team covered system performance, reliability, maintainability, interoperability, accuracy of avionics displays, equipment certification procedures, pilot procedures, maintenance manuals, AT, AF, and pilot training.
- There are 75 aircraft equipped with the Capstone avionics suite and 7 installations are completed this month.

## December:

- The overall Capstone Safety Engineering Report #1, ADS-B Radar-Like Services, Volumes 1-3 (draft) dated December 2, 2000 was completed. The need for this end-to-end safety review was identified by the Administrator in her letter to the Alaska Air Carriers Association on January 3, 2000. In that letter, Ms. Garvey set the January 1, 2001, goal for providing IFR services based on ADS-B
- The Capstone Program Office briefed the Gulf of Mexico Work Group in Houston. The work group is interested in a Capstone-like ADS-B system to provide an affordable surveillance solution for helicopter shuttle services in the Gulf. Virgil Russell, Director of Operations for Petroleum Helicopters, and Robert Zoldos, Director of Air Traffic Control System Operations for Air Transport Association, extended the invitation for the Capstone Office to speak.
- A draft Notice 7110.xxx, Subject: Air Traffic Control Procedures and Phraseology Associated with ADS-B at Anchorage ARTCC dated December 12, 2000 from Flight Standards provides for the use of the ADS-B system as a surveillance tool and further defines separation standards.
- Findings and recommendations from the Capstone Program Readiness Review were delivered to Steve Brown, Associate Administrator for Air Traffic Services, ATS-1, on December 19<sup>th</sup>. The review was conducted at his request to identify outstanding issues for Capstone's Automatic Dependent Surveillance-Broadcast (ADS-B) transition to providing IFR services in the Bethel area. An ad hoc team led by the Office of Independent Test and Evaluation, ATQ, performed the assessment (see next item).
- On December 20<sup>th</sup>, Capstone's Overview Committee heard status reports and proposed resolutions for 13 issues identified during the Capstone Program Readiness Review, 5 of which were critical for successful radar-like air traffic control services. The five tasks there were identified were:
  - (1) Load new Micro-EARTS operational system on 12/28/00.
  - (2) End-to-end certification flight check of new software and GBT's.
  - (3) ATC Training for 7 shifts at Anchorage ARTCC.
  - (4) Airway Facilities Training at 60% which is satisfactory for IOC and OJT training on Micro-EARTS components.
  - (5) Memorandum of Understanding with NATCA.
- On December 19<sup>th</sup>, two Capstone equipped aircraft flew flight check profiles from Bethel to confirm elimination of an identified software track bonding anomaly in the Micro-EARTS computer program, Version A3. The flight check involved the two airplanes flying converging and diverging paths to verify that bonding anomaly that has occurred when two aircraft, flying at different altitudes, simultaneously report the same GPS-based latitude and longitude had been corrected. The check flight proved successful, eliminating a potential "show-stopper" for 01/01/01 "radar-like service" implementation.
- The revised Micro-EARTS program (version MCPa3.ZA3) was successfully loaded on the developmental Micro-EARTS on December 20<sup>th</sup> for testing.

- Supplemental Type Certificate Number SA02149AK was amended on December 19, 2000, by the Anchorage Aircraft Certification Office, ACE-115N, to permit the modified Capstone UAT operating on 981MHz to be installed and used for radar-like IFR services. The first eight (8) modified UAT transceivers were shipped from the UPS Aviation Technologies factory in Salem, Oregon, to the Capstone Office on December 21, 2000.
- A Decision Paper supporting installation of a UAT transceiver in a local flying school's Cessna 172 was generated as well as one to support modification of the Micro-EARTS to permit setting of altitude filter limits and to enable ADS-B flight following services to be delivered via the Volpe Center and commercial vendors.
- Capstone developmental training displays were installed in the Anchorage Air Route Traffic Control Center (ARTCC) for controller evaluation purposes in accordance with the local NATCA Memorandum of Understanding signed on December 27<sup>th</sup>. The two displays, one at the west expansion position and the other at the watch desk, will not be linked to the operational system so that evaluators can test various MEARTS functions without affecting live operations. Once a track is initiated, actions will occur just as in the operational environment.
- On December 29, 2000, four (4) Capstone aircraft were converted to the new UAT frequency, 981MHz, in anticipation of the December 31<sup>st</sup> inaugural "radar-like service" flight. Converting these four aircraft earlier than the rest of the participants was necessary in order to ensure the UAT and the FAA's Enroute Air Traffic control automation systems could be tested and are ready to provide IFR services as scheduled. Conversion of the remaining Capstone equipped aircraft to 981MHz is planned to occur over the latter half of January.
- . The 966MHz datalink radios are being returned to the UPS Aviation Technologies factory in Salem, Oregon for modification to operate at 981MHz.
- Three Capstone Program Decision Papers were coordinated during the past week. Decision Paper #19 provides for additional safety study and pilot training activities by UAA that are required as a result of the Capstone Program's transition to providing IFR radar-like services. Eight (8) separate video training tapes and two Power Point presentations on the Capstone safety study will be delivered. Decision Paper #20 also involves the University; it provides for phase II pilot training and implementation of a study regarding Capstone's safety impact in Southeast Alaska. The scope includes provision of a Capstone-equipped aircraft for demonstration flights and use of a Capstone-equipped flight training device. Decision Paper #21 covers demonstration of runway safety improvements. Runway occupancy alerting software will be loaded in each Capstone MX-20 multifunction display and low-power ADS-B transmitters will be installed in airport maintenance and service vehicles within the Yukon-Kuskokwim Delta area.
- The first major advance in air traffic surveillance technology since the advent of radar 53 years ago began in the Bethel area at 00:00 GMT on January 1, 2001. The Federal Aviation Administration (FAA) and its industry partners initiated the first successful use of Automatic

Dependent Surveillance-Broadcast (ADS-B) datalink technology by air traffic controllers to track and provide ADS-B vectors to an IFR aircraft when not under primary or secondary radar contact. A flight profile was prepared by the Capstone Program Office to utilize ADS-B for radar-like IFR services on January 1, 2001. The plan involved a Capstone-equipped CASA 212 aircraft descending beneath radar coverage at 5,000 feet MSL flying approximately 30 NM inbound to Bethel, Alaska. During the aircraft's descent, its position icon on the controller's display transitioned seamlessly from a radar symbol (/) to an ADS-B symbol (I). At the pilot's request, controllers vectored the flight, using its ADS-B position on their display, to intercept the runway 18 ILS localizer approach to the Bethel Airport. During the flight to Bethel from Anchorage, the CASA's crew observed a Capstone-equipped Northern Air Cargo DC-6 aircraft flying 2,000 feet overhead on their MX-20 multifunction display. This milestone flight culminated 12 months of intense work by Capstone team members, FAA personnel in Headquarters and at the William J.

Hughes Technical Center, NISC employees, the MITRE Corporation's

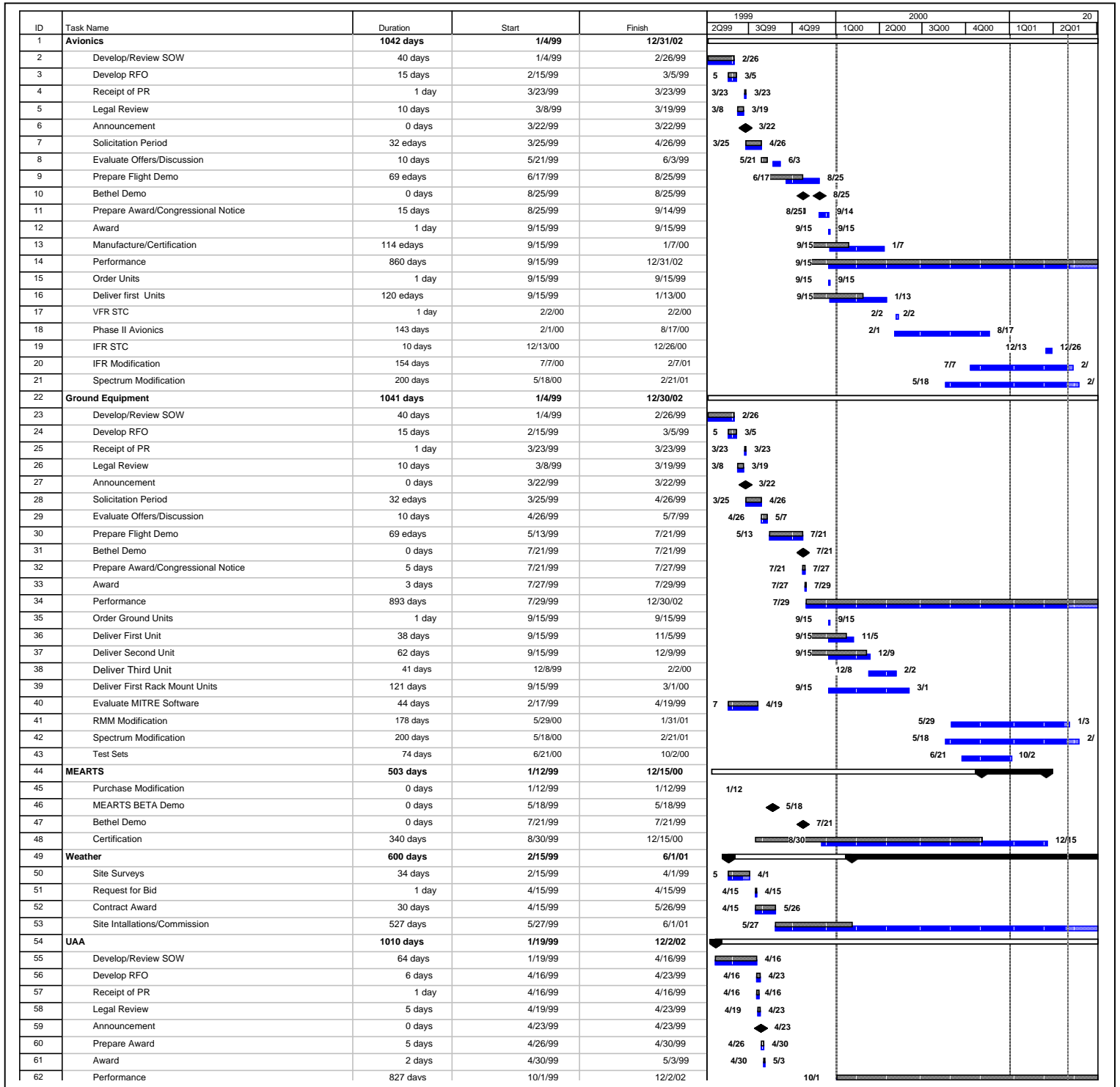
- Center for Advanced Aviation System Development, Lockheed Martin Corporation, and UPS Aviation Technologies. Over 160 major activities had to be completed on the critical path to make this a successful flight. Observers on board the CASA included John Hallinan, Capstone Program Manager, reporters Rhonda McBride of KTUU Channel 2 News and Rob Stapleton of the Alaska Journal of Commerce, Paul Bowers, Alaska DOTPF, Ginny Hyatt, Alaska Aviation Safety Foundation, Felix Maguire, Alaska Airmen's Association, and several members of the FAA's Capstone team. This achievement marked the initiation for Initial Operational Capability (IOC) of Phase 1 for the Capstone Program.
- There were 2 aircraft equipped this month which makes 77 Capstone-equipped aircraft in operation.



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# Capstone Timeline



**Spending Plan for FY01 F&E Funding as of January 31, 2001**

<b>Spend Plan</b>	<b>1Q 01</b>	<b>2Q 01</b>	<b>3Q 01</b>	<b>4Q 01</b>	<b>1Q 02</b>	<b>2Q 02</b>	<b>3Q 02</b>	<b>4Q 02</b>	<b>Totals</b>
<b>Avionics</b>		\$ .6M	\$4.0M	\$ .5M					<b>\$5.1M</b>
<b>Ground</b>			\$1.65M	\$1.1M					<b>\$2.75M</b>
<b>Cert Proced</b>		\$ .36M	\$ .6M						<b>\$ .96M</b>
<b>FIS/TIS/GPS</b>			\$ .508M						<b>\$ .508M</b>
<b>MISC/SPO</b>		\$ .7M	\$1.1M	\$ .13M					<b>\$1.93M</b>
<b>AWOS</b>		\$ .47M							<b>\$ .47M</b>
<b>MITRE</b>	\$ .5M								<b>\$ .5M</b>
<b>Totals</b>	<b>\$ .5M</b>	<b>\$2.13M</b>	<b>\$7.858M</b>	<b>\$1.73M</b>					<b>\$12.218M</b>
<b>Travel</b>	\$53K	\$52K	\$60K	\$40K					<b>\$ .205M</b>

**Capstone Spend Plan:**

- a. 1Q 01: \$500K to fund 2 man-years at MITRE
- b. 2Q 01: Avionics-\$600K to finish Y-K delta installations and purchase spares. \$360K to fund MEARTS sectorization modification. \$700K for engineering support. \$470K for AWOS support.
- c. 3Q 01: \$4M to fund avionics in SE AK. \$1.65M for multilateration in JNU and 11 GBTs in Y-K delta. \$600K for CCCS and RMM for certification of ground architecture. \$508K for flight following and FIS subscriptions. \$1.1M for engineering support.
- d. 4Q 01: \$500K for avionics software. \$1.1M for GBTs and communications in SE AK. \$130K for engineering support.

## **Capstone Phase 1 Status of Program Elements**

### **Element 1. Aircraft Equipment Package**

A. Coordinate and complete a Request For Information (RFI).	Completed
B. Coordinate and complete a Request For Offer (RFO).	Completed
C. Down select prospective vendor	Completed
D. Initial operational capability demonstration	Completed
E. Contract awarded	Completed
F. Install equipment	In Progress

### **Element 2. Obtain and Install Ground Infrastructure to Support ADS-B**

A. Coordinate and complete a Request For Information (RFI).	Completed
B. Coordinate and evaluate purchase of a Mitre Ground Station.	Cancelled
C. Coordinate and complete a Request for Offer (RFO).	Completed
D. Down select prospective vendor	Completed
E. Initial operational capability demonstration	Completed
F. Contract awarded	Completed
G. Install Ground Stations	In Progress

**Element 3. Micro-EARTS Adaptation**

- |   |             |
|---|-------------|
| A. Procure modification to Micro-EARTS. | Completed   |
| B. Conduct BETA Demo                    | Completed   |
| C. Conduct design reviews               | Completed   |
| D. Certification                        | In Progress |

**Element 4. Coordinate/Obtain/Implement Flight Information Services (FIS)**

- |                                   |           |
|-----------------------------------|-----------|
| A. National contractor selection. | Completed |
| B. Select contractor              | Completed |

**Element 5. Train Capstone Participants**

- |                                |             |
|--------------------------------|-------------|
| A. Complete statement of work. | Completed   |
| B. Issue contract              | Completed   |
| C. Conduct Training            | In Progress |

**Element 6. Obtain and Install Automated Weather Equipment**

- |  |             |
|--|-------------|
| A. Select prospective sites                | Completed   |
| B. Perform site surveys                    | Completed   |
| C. Procure the automated weather equipment | Completed   |
| D. Install automated weather equipment     | In Progress |

**Element 7 Conduct Safety and Human Factors Study**

A. Complete statement of work.	Completed
B. Issue contract	Completed
C. Conduct Study	In Progress

## Program Elements

### *1. Aircraft Equipment Package*

Objective	Purpose
<p>To equip up to 150 aircraft used by the commercial operators in the Yukon-Kuskokwim delta region of Alaska with a government-furnished Global Positioning System (GPS) based avionics package.</p>	<p>A significant number of mid-air collisions, controlled flight into terrain incidents, and weather-related accidents can be avoided with new technologies incorporated into the Capstone avionics package. The Alaskan Region's "Capstone Program" is an accelerated effort to improve aviation safety and efficiency through installation of government-furnished Global Positioning System (GPS)-based avionics and data link communications suites in most commercial aircraft serving the Yukon-Kuskokwim delta area. Capstone-equipped aircraft will be used initially to validate three of the nine high priority Free Flight Operational Enhancements requested by RTCA.</p> <ul style="list-style-type: none"> <li>• Flight Information Services (FIS)</li> <li>• Cost Effective Controlled Flight Into Terrain (CFIT) Avoidance</li> <li>• Enhanced See and Avoid</li> </ul> <p>The Capstone program will provide real world information and experience that will provide enhanced safety and operational capabilities.</p>
<p style="text-align: center;"><b>Progress/Outcomes</b></p> <p>A. Coordinate and complete a Request For Information (RFI).</p> <p><b><u>Progress: - Completed</u></b></p> <p>The Alaskan Region's Logistics Division published in the Commerce Business Daily a "Request for Information (RFI)." The RFI publicly announced to interested avionics vendors the FAA's proposed Capstone Program and requested submission of information on their products, services, and capabilities which are currently available, to meet the needs for the Capstone program. Information provided by the five vendors who responded will be considered as the FAA prepares performance specifications for Capstone Program avionics and ground transceiver equipment.</p>	

***Aircraft Equipment Package - cont.***

**Progress/Outcomes - cont.**

**B. Coordinate and complete a Request for Offer (RFO)**

**Progress 1<sup>st</sup> Quarter FY99: - In Progress**

The Alaskan Region's Logistics Division in coordination with ACO, AND, AIR and the Industry Council is working to complete the RFO.

**Progress 2<sup>nd</sup> Quarter FY99: - Completed**

The Alaskan Region's Logistics Division completed the RFO. The announcement was made on the internet March 22, 1999. The RFO will close April 26, 1999.

The Request for Proposals (RFP) for avionics suites will be published in hard copy controlled by the Logistics Division. Standard performance specifications common to the avionics industry are being utilized.

**C. Down select prospective vendor**

**Progress 3<sup>rd</sup> Quarter FY99: - Completed**

The Avionics RFO closed April 26, 1999. UPS Aviation Technologies (formerly II Morrow, Inc), an Oregon based subsidiary of United Parcel Service was down selected. UPS AT will be required to produce at least two sets of installed avionics (in aircraft provided by UPS AT), a ground station, and related software to demonstrate operation of the proposed avionics system, in flight, at Bethel, Alaska in August 1999. Following a successful flight demonstration, a production contract will be awarded. The number of avionics suites purchased, up to a maximum of 200, will be based on the total available budget of \$4 million. It is anticipated approximately 150 units will actually be procured.



***Aircraft Equipment Package - cont.***

**Progress/Outcomes - cont.**

D. Conduct Initial operational capability demonstration

**Progress 3<sup>rd</sup> Quarter FY99: - In Planning**

An initial operational capability demonstration is scheduled for August 25, 1999. UPS AT will produce at least two sets of installed avionics (in aircraft provided by UPS AT), a ground station, and related software to demonstrate operation of the proposed avionics system, in flight, at Bethel Alaska.

**Progress 4<sup>th</sup> Quarter FY99: - Completed**

An initial operational capability demonstration was completed on August 25, 1999. . UPS AT, using a company-owned Beechcraft King Air airplane and a specially equipped Cessna Model 208 Caravan furnished by PenAir, UPS AT, demonstrated that its proposed Global Positioning System (GPS) navigation unit, multi-function cockpit display (MFD), and datalink radio system would meet FAA performance specifications for the Capstone Program.

E. Award Contract

**Progress 4<sup>th</sup> Quarter FY99: - Completed**

A determination was made that FAA specifications were met and a contract was awarded on September 13<sup>th</sup>, 1999. The contract was for Capstone avionics systems, installation kits, terrain databases, ground-based transceivers, an avionics training simulator and training assistance.

F. Install Equipment

**Progress 1<sup>st</sup> Quarter FY00 - In Progress**

A provisioning STC, issued 16 November 1999 permits installation of the GX-50/60 GPS navigator and provisions for the Capstone configured MX-20 and UAT transceiver. Nine provisional STC kits have been forwarded to three of the Bethel commercial operators, Larry's Flying Service, Peninsula Airways, Inc., and Ptarmigan Air, for installation. One complete Capstone avionics package, to include the MX-20 multifunction display and UAT transceiver, has been installed in the University of Alaska, Anchorage Cessna 180 for certification flight-testing.

**Progress 2<sup>nd</sup> Quarter FY00 - In Progress**

Ten (10) airplanes were installed with Capstone avionics suits in the second quarter. These installations took place in Anchorage, Fairbanks, and Bethel, Alaska. Operators participating in the Capstone program as well as independent avionics shops are participating in the installation of the Capstone avionics suites. UPS AT has delivered seventy-one (71) avionics suites to date.

**Progress 3<sup>rd</sup> Quarter FY00 - In Progress**

Thirty-one (31) airplanes were installed with Capstone avionics suits in the third quarter for a total of forty-one (41) installed to date.

**Progress 4<sup>th</sup> Quarter FY00 – In Progress**

Sixty (60) aircraft have been installed with Capstone avionics suites with 9 installations in-progress.

**Progress 1<sup>st</sup> Quarter FY01 – In Progress**

Seventy-seven (77) aircraft have been installed with Capstone avionics suites with 9 installations in-progress.

## 2. Obtain and Install Ground Infrastructure to Support ADS-B

Objective	Purpose
To install ADS-B ground stations at up to twelve (12) locations in the Yukon-Kuskokwim delta region of Alaska	To provide enhanced see and avoid information each ADS-B equipped aircraft broadcasts its precise position in space via a digital datalink along with other data, including airspeed, altitude and whether the aircraft is turning, climbing or descending. This provides other aircraft, as well as ground facilities that have ADS-B equipment a much more accurate depiction of air traffic than radar can provide. To provide the digital datalink capability in a cost-effective manner requires the installation of ground based transceivers.
<p style="text-align: center;"><b>Progress/Outcomes</b></p> <p>A. Coordinate and complete a Request For Information (RFI)</p> <p><b><u>Progress : - Completed</u></b></p> <p>The Alaskan Region’s Logistics Division published in the Commerce Business Daily a “Request for Information (RFI).” The RFI publicly announced to interested avionics vendors the FAA’s proposed Capstone Program and requested submission of information on their products, services, and capabilities which are currently available, to meet the needs for the Capstone program. Information provided by the five vendors who responded will be considered as the FAA prepares performance specifications for Capstone Program avionics and ground transceiver equipment.</p> <p>B. Coordinate and evaluate purchase of a Mitre Ground Station.</p> <p><b><u>Progress 2<sup>nd</sup> Quarter FY99: - In Progress</u></b></p> <p>The Alaskan Region Airway Facilities Division is in coordination with the SF21 office and Mitre/CAASD personnel regarding purchase of a Mitre ground station from the existing contract with IIMorrow for the Ohio Valley ground stations.</p> <p><b><u>Progress 3<sup>rd</sup> Quarter FY99: - On Hold</u></b></p> <p>The purchase of the Mitre ground station is on hold. The proposed vendor ground station and datalink infrastructure may not require an additional Mitre ground station. A decision will be made after the August equipment demonstration in Bethel.</p>	

***Obtain and Install Ground Infrastructure to Support ADS-B - cont.***

**Progress/Outcomes - cont.**

B. Coordinate and evaluate purchase of a Mitre Ground Station – cont.

**Progress 4<sup>th</sup> Quarter FY99: - Cancelled**

The purchase of the Mitre ground station has been cancelled. The proposed vendor ground station and datalink infrastructure does not require an additional Mitre ground station.

C. Coordinate and complete a Request for Offer (RFO) for ground stations.

**Progress 2<sup>nd</sup> Quarter FY99: - Completed**

The Alaskan Region's Logistics Division completed the RFO. The announcement was made on the internet March 22, 1999. The RFO will close April 26, 1999.

The Request for Proposals (RFP) for avionics suites will be published in hard copy controlled by the Logistics Division. After an initial bidding period, FAA will accept written proposals for evaluation. An independent team will then select the best apparent offer based on technical qualifications and cost considerations using previously documented objective selection criteria. The number of ground stations allowed to be purchased as a separate line item under the Avionics contract includes a minimum of 12 and maximum of 50 sets if the line item is exercised. The apparent successful vendor will be required to produce at least two sets of installed avionics (in aircraft provided by the manufacturer), a ground station, and related software to demonstrate operation of the proposed avionics system, in flight, at Bethel, Alaska in July 1999. Following a successful demonstration, the decision to order ground stations from the Avionics vendor will be made. The Avionics RFP will include a delivery line item for data link ground stations compatible with the avionics. FAA may procure all necessary units from the vendor, or purchase some or all from another source, with cost being the primary consideration. Additional units beyond the 12 immediately required may be procured from the vendor if it is determined advantageous to FAA and if funds become available.

***Obtain and Install Ground Infrastructure to Support ADS-B - cont.***

**Progress/Outcomes - cont.**

D. Down select prospective vendor.

**Progress 3<sup>rd</sup> Quarter FY99: - Completed**

UPS Aviation Technologies (formerly II Morrow, Inc), an Oregon based subsidiary of United Parcel Service was down selected. UPS AT will be required to produce at least two sets of installed avionics (in aircraft provided by UPS AT), a ground station, and related software to demonstrate operation of the proposed avionics system, in flight, at Bethel, Alaska in August 1999. Following a successful flight demonstration, a production contract will be awarded. FAA may procure all necessary units from the vendor, or purchase some or all from another source, with cost being the primary consideration. Additional units beyond the 12 immediately required may be procured if it is determined advantageous to FAA and if funds become available.

E. Conduct initial operational capability demonstration.

**Progress 3<sup>rd</sup> Quarter FY99: - In Planning**

The initial operational capability demonstration is planned for August 25, 1999. UPS AT will be required to produce at least two sets of installed avionics (in aircraft provided by UPS AT), a ground station, and related software to demonstrate operation of the proposed avionics system, in flight, at Bethel Alaska.

MITRE is teaming with the Alaskan Region to develop and configure an architecture and network for the Capstone program. The system will be based on the proven Ground Base Server developed by MITRE and tested on several though the Safe Flight 21 work with the CAA Ohio Valley project.

**Progress 4<sup>th</sup> Quarter FY99: - Completed**

An initial operational capability demonstration was completed on August 25, 1999. UPS AT, using a company-owned Beechcraft King Air airplane and a specially equipped Cessna Model 208 Caravan furnished by PenAir, UPS AT, demonstrated that its proposed ground station system would meet FAA performance specifications for the Capstone Program.

*Obtain and Install Ground Infrastructure to Support ADS-B - cont.*

**Progress/Outcomes - cont.**

F. Award contract

**Progress 4<sup>th</sup> Quarter FY99: - Completed**

After analyzing the data from the initial operational capability demonstration a determination was made that FAA specifications were met and a contract for the ground stations was awarded on September 13<sup>th</sup>

G. Install ground stations.

**Progress 4<sup>th</sup> Quarter FY99: - Awaiting delivery**

Seven ground stations have been ordered to date.

**Progress 1<sup>st</sup> Quarter FY00: - In Progress**

Six additional ground stations were ordered in the first quarter of FY00. Two from the 4<sup>th</sup> quarter FY99 original order have been received. It is anticipated that the installation of these two ground stations, at Bethel and Anchorage Center, will occur second quarter of FY00.

**Progress 2<sup>nd</sup> Quarter FY00: - In Progress**

Two developmental Ground Based Transceivers (GBT)s were installed at Anchorage Center and Bethel during January 2000. These GBT's will be used for test and development of the ground system and will be replaced by certified units, when available.

**Progress 3<sup>rd</sup> Quarter FY00: - In Progress**

Installation at Cape Newenham Minimally Attended Radar (MAR) was completed on June 4<sup>th</sup>. The Bethel GBT was certified on June 21<sup>st</sup>. The GBT installation at Cape Romanzof is scheduled beginning the first week of July.

**Progress 4<sup>th</sup> Quarter FY00: - In Progress**

Cape Romanzof Minimally Attended Radar (MAR) install completed and FIS connectivity into Anchorage ZAN finished.

***Obtain and Install Ground Infrastructure to Support ADS-B - cont.***

**Progress/Outcomes - cont.**

G. Install ground stations – cont.

**Progress 1<sup>st</sup> Quarter FY01: - In Progress**

All GBTs have been changed over to 981MHz at each of the three locations. The Bethel operational GBT has been certified back to the ZAN to provide radar-like service information to IFR ADS-B traffic. The developmental GBT at Bethel is providing textual Flight Information Service (FIS) i.e., METAR/TAF products, on an interim basis pending certification on the operational system.

### 3. Micro-EARTS Adaptation

Objective	Purpose
Adapt the Micro-EARTS at the Anchorage ARTCC to receive and process ADS-B position reports and fuse radar targets for display to air traffic controllers and pilots.	To allow pilots of Capstone-equipped aircraft to see radar targets for all nearby aircraft as well as ADS-B equipped aircraft position reports and radar targets via Traffic Information Service-Broadcast (TIS-B) for all nearby traffic on their multiple function display (MFD). The Micro-EARTS at the Anchorage ARTCC is being adapted to receive and process ADS-B position reports and fuse radar targets for display to air traffic controllers and pilots.
<p style="text-align: center;"><b>Progress/Outcomes</b></p> <p>A. Procure and install modification to Micro-EARTS.</p> <p><b><u>Progress 2<sup>nd</sup> Quarter FY99: -In progress</u></b></p> <p>A contract modification will be negotiated with Lockheed Martin for development of M-EARTS functions to support the Capstone Program. This principally includes display of ADS-B targets fused with radar targets and the capability to produce Traffic Information Service-Broadcast (TIS-B). Funding for this \$2.8 million contract modification has already been transferred to Headquarters. A Beta Demonstration is planned for May 1999 with a demonstration planned for July 1999.</p> <p><b><u>Progress 3<sup>rd</sup> Quarter FY99: -Completed</u></b></p> <p>Lockheed-Martin Corporation representatives installed the Capstone Micro-EARTS modification during April in preparation of the Beta-demonstration.</p> <p>B. Conduct Beta Demonstration.</p> <p><b><u>Progress 3<sup>rd</sup> Quarter FY99: -Completed</u></b></p> <p>The modification was successfully demonstrated during the week of April 19 and again on May 18-19. Radar targets were fused with ADS position reports and displayed on remote displays. Following testing, this capability is expected to reach Operational Readiness Demonstration by August 2000.</p>	



C. Design Reviews.

**Progress 3<sup>rd</sup> Quarter FY99: - In Planning**

Preliminary Design Review (PDR) for the MEARTS modification is scheduled for July 19-23<sup>rd</sup> July.

**Progress 4<sup>th</sup> Quarter FY99: - In Progress**

A Micro-EARTS Preliminary Design Review (PDR) at Anchorage ARTCC was completed during July. The Capstone modification to show ADS-B equipped aircraft on controller displays was discussed with Lockheed Martin representatives along with other software improvements. It will take about one year of testing before the ADS-B service can be certified for air traffic management functions.

**Progress 1<sup>st</sup> Quarter FY00: - In Progress**

**Progress 2<sup>nd</sup> Quarter FY00: - In Progress**

**Progress 3<sup>rd</sup> Quarter FY00: - Completed**

Design reviews were completed by AOS in May 2000. Software was delivered and installed in the Anchorage ARTCC in June.

**Progress/Outcomes - cont.**

D. Certification

**Progress 3<sup>rd</sup> Quarter FY99: - In Planning**

**Progress 4<sup>th</sup> Quarter FY99: - In Progress**

An initial operational capability demonstration was completed on August 25, 1999 during the Bethel demonstration. A meeting held in Salem Oregon, September 30<sup>th</sup>, 1999 resulted in a process to baseline and develop the Mitre software to be included in the certification process.

**Progress 1<sup>st</sup> Quarter FY00: - In Progress**

The certification effort is proceeding on schedule to meet the August FY00 timeline. Numerous telecons have been held as a follow-up to the meeting in Oregon. An additional group meeting is scheduled for the second quarter FY00 at the Technical Center in Atlantic City, New Jersey.

**Progress 2<sup>nd</sup> Quarter FY00: - In Progress**

A Capstone Engineering conference was conducted in February at the William J. Hughes Technical Center in Atlantic City, New Jersey. The principal topic was the hardware and software architecture for certification testing of the Capstone ADS-B ground system. Future system requirements for uplink of FIS-B and TIS-B products to aircraft were also discussed. In March 2000 an avionics suite was shipped from UPS AT direct to the Technical Center to support certification testing of the Capstone ground system.

**Progress/Outcomes - cont.**

D. Certification – cont

**Progress 3<sup>rd</sup> Quarter FY00: - In Progress**

IOC (Initial Operating Capability) scheduled for June 29<sup>th</sup> has been delayed. It is anticipated that IOC will occur in July 2000.

- a. The Micro-EARTS program was delivered and installed at the Anchorage ARTCC on June 21. An IOC evaluation, including adding the ADS-B data to the controllers' displays, was successfully completed on June 27.
- b. Air Traffic advised that two items remained could be declared: A procedures issue must be resolved between Air Traffic and Flight Standards and the Memorandum of Agreement (MOA) with NATCA must be completed.
- c. The NATCA MOA is expected to be completed within the next two weeks. While IOC has been delayed, we don't expect any impact to the projected Operational Readiness Demonstration (ORD).

**Progress 4<sup>th</sup> Quarter FY00: - In Progress**

- a. A 30 day data analysis period started at the Anchorage Center on September 25, 2000.
- b. A NATCA MOA for evaluation is being coordinated.
- c. Procedure issues are being developed and will be finalized between Air Traffic and Flight Standards, and the final Memorandum of Agreement (MOA) with NATCA will be completed following data analysis.

**Progress 1<sup>st</sup> Quarter FY01: - In Progress**

Initial Operating Capability (IOC) was achieved on 01/01/01 with the successful implementation of radar-like service to an Capstone ADS-B equipped aircraft receiving IFR vectors into the Bethel airspace. However, the capability to fuse radar targets with ADS-B position reports exists for controllers but has yet to be achieved to the pilots, i.e. TIS-B.

#### 4. Coordinate/Obtain/Implement Flight Information Services (FIS)

Objective	Purpose
To work in conjunction with AND-700 to obtain and field FIS.	There is a significant amount of data in the National Airspace System that, if the pilot could have access to it in the cockpit, would make the flight safer through improved situational awareness (e.g., weather information) or more cost effective (e.g., knowledge of special use airspace restrictions). Without this information the pilot faces uncertain weather hazards and other operational inefficiencies. Capstone will use the Flight Information System (FIS) to receive current and forecasted weather and weather-related information as well as the status of SUAs. The enhanced weather products will be available to pilots and controllers, allowing them to share the same situational awareness. The information will be displayed graphically to the pilot. Expected benefits: increased availability of flight services, increased timeliness and quality of data on weather and system status, increased access to airspace, and reduced flight times and distance.
<p style="text-align: center;"><b>Progress/Outcomes</b></p> <p>A. National contractor selection.</p> <p><b><u>Progress 2<sup>nd</sup> Quarter FY99: -In progress</u></b></p> <p>FAA selection of a national contractor(s) is underway for delivery of FIS products to properly equipped aircraft via a data link system.</p> <p><b><u>Progress 3<sup>rd</sup> Quarter FY99: -In progress</u></b></p> <p>FAA selection of a national contractor(s) is continuing. It appears that there will be a down select of two (2) service providers for the FISDL RFO by July 23,1999.</p> <p><b><u>Progress 4<sup>th</sup> Quarter FY99: - Completed</u></b></p> <p>On July 28, 1999 ARNAV Systems, Incorporated and NavRadio Corporation were selected as the national Flight Information Services Data Link (FISDL) service providers by headquarters. We will be examining the products and services offered by these vendors to determine which might be suitable for the commercial operators in the Capstone service area</p>	

*Coordinate/Obtain/Implement Flight Information Services (FIS) - cont.*

**Progress/Outcomes - cont.**

B. Select Contractor

**Progress 4<sup>th</sup> Quarter FY99: - In Progress**

We are currently reviewing the contracts of each FISDL service provider to determine the national vendor products and services to be used in the Capstone program.

**Progress 1<sup>st</sup> Quarter FY00: - In Progress**

We are continuing to work with industry and UPS AT to determine the Capstone FIS requirements.

**Progress 2<sup>nd</sup> Quarter FY00: - In Progress**

Capstone team members James Call and Dave Palmer met with Rita McNair, contracting officer, in headquarters during January 2000. As a result of the meeting an informational request outlining the Capstone weather requirements was prepared and sent to both FISDL vendors. The response from Honeywell (formally NavRadio Corporation) indicated that they could not meet our timeframe. A Capstone Technical Review Committee reviewed ARNAV's proposal and submitted a report of their findings to the Capstone Program manager.

**Progress 3<sup>rd</sup> Quarter FY00: - In Progress**

On June 29<sup>th</sup> a Notice of Award letter was sent to ARNAV Systems, Incorporated. The one-year contract is to supply FIS METAR (including SPECI) and TAF products pertinent to Alaska as well as a data transmission link, and training and support provisions for the development and implementation of Capstone transmitted weather products.

**Progress 4<sup>th</sup> Quarter FY00: - Completed**

FIS installed at the Anchorage ZAN and is operational on the developmental system at Bethel and Anchorage.

### 5. Train Capstone Participants

Objective	Purpose
To ensure all participants in the Capstone program are properly trained on the Capstone avionics.	To ensure the Capstone avionics equipment is utilized properly and to the fullest to achieve the greatest benefit to enhanced safety and operational capabilities all participants must be trained.
<p style="text-align: center;"><b>Progress/Outcomes</b></p> <p>A. Complete the statement of work.</p> <p><b><u>Progress 2<sup>nd</sup> Quarter FY99: - In Progress</u></b></p> <p>The statement of work for training Capstone participants was delivered to the Alaskan Region's Logistics Division. The contracting officer is working with the Capstone office and the Regional Counsel Office to complete the training contract. It is anticipated that the contract will be awarded during the FY99 third quarter.</p> <p><b><u>Progress 3<sup>rd</sup> Quarter FY99: - Completed</u></b></p> <p>The contracting officer has issued the package to UAA and received their response. It is anticipated that the contract will be awarded during the FY99 fourth quarter.</p> <p>B. Issue contract</p> <p><b><u>Progress 3<sup>rd</sup> Quarter FY99: - In Progress</u></b></p> <p>The contracting officer has issued the package to UAA and received their response. It is anticipated that the contract will be awarded during the FY99 fourth quarter.</p> <p><b><u>Progress 4<sup>th</sup> Quarter FY99: - Completed</u></b></p> <p>The University of Alaska has been awarded a contract to deliver a pilot training program for the Capstone equipment and to conduct Capstone participant training.</p>	

**Progress/Outcomes - cont.**

C. Conduct training

**Progress 4<sup>th</sup> Quarter FY99: - In Planning**

The University of Alaska is working with the Capstone office, UPS AT, Anchorage FSDO, industry Council and the Bethel operators to develop the Capstone avionics training program. A beta training class is scheduled for 1<sup>st</sup> quarter FY00.

**Progress 1<sup>st</sup> Quarter FY00: - In Planning**

The University of Alaska conducted a beta session for the Capstone Pilot Training Program on December 7<sup>th</sup> and 8<sup>th</sup> at the Merrill Field complex. Several industry pilots were in the beta class along with an Industry Council representative, a FSDO inspector, and a pilot from the Capstone Program Office and an Air Traffic controller. Feedback from the beta class will be used to finalize the training curriculum. Formal Capstone training is scheduled to begin in the 2<sup>nd</sup> quarter FY00.

**Progress 2<sup>nd</sup> Quarter FY00: - In Progress**

The University of Alaska (UAA) is using four (4) certified Capstone simulators for pilot training. The first session of the Capstone Pilot Training Program for Air Carrier Instructors and Check Airmen was conducted in Bethel in February. Training classes will continue through the third quarter in Anchorage and Bethel. UAA received an excellent grade on the critique submitted by every student.

**Progress 3<sup>rd</sup> Quarter FY00: - In Progress**

UAA conducted three Air Carrier Instructors and Check Airmen training sessions during the third quarter, two in Anchorage and one in Bethel. A total of 20 participants were trained.

**Progress 4<sup>th</sup> Quarter FY00: - In Progress**

The University of Alaska Anchorage Aviation Technology has trained an additional 36 pilots in the use of Capstone avionics through direct contract with participating air carriers.

**Progress 1<sup>st</sup> Quarter FY01: - In Progress**

UAA has continued a rigorous training schedule and has provided “on-site” classes and demonstrations on numerous occasions.

## 6. Obtain and Install Automated Weather Equipment

Objective	Purpose
To obtain and install Automated Weather Observing Equipment at up to 10 sites in the Capstone area.	To assist in providing weather information to accomplish IFR enroute and landings at Capstone area airports and to enable the use of the, up to eighteen, new GPS approaches requires current weather information be available. The weather observation equipment will meet at least the minimum functionality required by the Federal Aviation Regulations to support an instrument approach procedure for commercial operators. Weather sensors will provide the following observations: (a) wind speed, direction, and gusts; (b) altimeter setting; (c) temperature and dew point; (d) cloud height and sky cover; and (e) visibility. The equipment will provide an automatic radio broadcast of observations and have the capability to provide remote weather observations via a telephone line or connection to Service A.
<p style="text-align: center;"><b>Progress/Outcomes</b></p> <p>A. Select prospective sites:</p> <p><b><u>Progress 1<sup>st</sup> Quarter FY99: - Completed</u></b></p> <p>The Industry Council has selected the following ten (10) villages as prospective sites for installation of automated weather equipment; Kipnuk, Platinum, Scammon Bay, Holy Cross, Kwigillingok, Kalskag, Mountain Village, Russian Mission, St. Michael, and Koliganek.</p> <p>B. Perform site surveys:</p> <p><b><u>Progress 1<sup>st</sup> Quarter FY99: - In Progress</u></b></p> <p>ANI 700 has scheduled the site surveys at the ten sites. Scheduled completion date is during the second quarter FY99.</p> <p><b><u>Progress 2<sup>nd</sup> Quarter FY99: - In Progress</u></b></p> <p>ANI 700 has completed 7 of 10 sites. The survey results will be used to install the automated weather equipment.</p>	



*Obtain and Install Automated Weather Equipment – cont.*

**Progress/Outcomes - cont.**

B. Perform site surveys – cont.

**Progress 4<sup>th</sup> Quarter FY99: - In Progress**

ANI 700 has completed 7 of 10 sites.

**Progress 1<sup>st</sup> Quarter FY00: - In Progress**

**Progress 2<sup>nd</sup> Quarter FY00: - Completed**

ANI 700 has completed the last three survey sites.

C. Procure the automated weather equipment.

**Progress 2<sup>nd</sup> Quarter FY99: - In Progress**

The preliminary strategy developed by the NAS Implementation Center, ANI-700, provides for procurement of 10 plastic equipment shelters under an existing government supply contract. ANI-700 plans to construct a prototype aluminum frame structure for support of weather sensors. Maintenance personnel in Anchorage will evaluate the frame, which will span the shelter, for field suitability and the design will be finalized. A competitive advertisement will next be issued to selected, pre-qualified, bidders. The contract will include procurement of FAA-certified aviation weather observation equipment of the type planned for “NEXWOS.” The sensors required will be the minimum necessary to support Capstone flight operations. The selected turnkey contractor will be responsible for fabrication of the aluminum frames per the FAA design drawings, installation of weather equipment within the government-furnished plastic shelters, transportation of all shelters, frames, and equipment to the specified village airports, and for installation at the specified locations in accordance with FAA design drawings and specifications.

**Progress 3<sup>rd</sup> Quarter FY99: - Completed**

The 10 plastic equipment shelters were purchased and shipped to Anchorage for retrofitting. Ten AWOS III facilities were purchased from Qualimetrix, Inc. The first item arrived and is being installed in a proto-type facility being constructed at the ANI Anchorage Complex.

***Obtain and Install Automated Weather Equipment – cont.***

**Progress/Outcomes - cont.**

**D. Install Automated Weather Equipment**

**Progress 3<sup>rd</sup> Quarter FY99: - In Progress**

Four sites have been selected for installation before the end of FY99. They include Scammon Bay, Holy Cross, Mountain Village and St. Michael. Real estate and utilities coordination is ongoing.

**Progress 4<sup>th</sup> Quarter FY99: - In Progress**

A proto-type facility for the Capstone automated weather observation equipment was constructed at the ANI Anchorage Complex. A "open house" was held at the Lake Hood property to inspect and "kick the tires" on the new weather station enclosure on Friday, September 9<sup>th</sup>. The materials and equipment will be shipped to Holy Cross in September 1999 to begin installation.

**Progress 1<sup>st</sup> Quarter FY00: - In Progress**

Phase I, which includes grounding, bonding and shelter installation was completed for four of the ten Capstone sites; Holy Cross, Mountain Village, Saint Michael and Scammon Bay. Phase II is scheduled for the 2<sup>nd</sup> quarter of FY00.

**Progress 2<sup>nd</sup> Quarter FY00: - In Progress**

With the cleanup of some exceptions, Phase II is nearing completion on the first four sites.

**Progress 3<sup>rd</sup> Quarter FY00: - In Progress**

Mountain village completed JAI on July 3, 2000. Holly Cross, Scammon Bay and St. Michael are anticipated to be completed in July. ANI-700 expects to have the other AWOS sites commissioned by this autumn.

***Obtain and Install Automated Weather Equipment – cont.***

**Progress/Outcomes - cont.**

**D. Install Automated Weather Equipment – cont.**

**Progress 4<sup>th</sup> Quarter FY00: - In Progress**

Seven (7) locations have been installed with one (1) commissioned (Mt. Village). St. Michael and Russian Mission or Kalskag will go through a 30 day ORD prior to have a Joint Acceptance Inspection (JAI) and commissioned which should be completed by late Oct. Once this occurs, the remaining 4 will receive a JAI and be commissioned directly. Kipnuk, Pilot Point and Koliganek require equipment installations but all buildings are on site. FAA-ANI expects all 10 locations to be commissioned by the end of the calendar year.

**Progress 1<sup>st</sup> Quarter FY01: - In Progress**

Eight (8) locations have been installed and the Joint Acceptance Inspection (JAI) has been completed with one (1) location commissioned (Mt. Village). Platinum and Pilot Point will be getting power and telco this spring. Commissioning is anticipated of all sites by this summer once all exceptions are cleared.

## 7. Conduct Safety and Human Factors Study

Objective	Purpose
To accomplish independent documentation, measurement, and reporting of the Capstone project.	A major "Capstone" objective is to improve safety in Alaska while offering efficiencies to operators. Key to the Capstones program's overall success is the need conduct an independent evaluation of system safety improvements and to document the user benefits.
<p>A. Complete the statement of work and issue contract.</p> <p><b><u>Progress 2<sup>nd</sup> Quarter FY99: -In Progress</u></b></p> <p>The statement of work for the safety study was delivered to the Alaskan Region's Logistics Division. The contracting officer is working with the Capstone office and the Regional Counsel Office to complete the contract. It is anticipated that the contract will be let during the third quarter.</p> <p><b><u>Progress 3<sup>rd</sup> Quarter FY99: - Completed</u></b></p> <p>The contracting officer has issued the package to UAA and received their response. It is anticipated that the contract will be led during the FY99 fourth quarter.</p> <p>B. Issue contract</p> <p><b><u>Progress 3<sup>rd</sup> Quarter FY99: - In Progress</u></b></p> <p>The contracting officer has issued the package to UAA and received their response. It is anticipated that the contract will be led during the FY99 fourth quarter.</p> <p><b><u>Progress 4<sup>th</sup> Quarter FY99: - Completed</u></b></p> <p>The University of Alaska has been contracted to conduct an independent analysis of safety improvements related to the Capstone program.</p>	

**Progress/Outcomes - cont.**

C. Conduct Study

**Progress 4<sup>th</sup> Quarter FY99: - In Progress**

The University of Alaska is in the process of gathering data to develop the baseline for the Capstone safety study.

**Progress 1<sup>st</sup> Quarter FY00: - In Progress**

Quarterly meetings are scheduled to discuss the study process and progress. An interim baseline report is scheduled for 2<sup>nd</sup> quarter FY00.

**Progress 2<sup>nd</sup> Quarter FY00: - In Progress**

UAA has submitted an electronic preliminary baseline data to the Capstone office. A review and evaluation of the information is underway.

**Progress 3<sup>rd</sup> Quarter FY00: - In Progress**

On June 9<sup>th</sup> the Capstone office forwarded a statement of work to contracting for the University of Alaska Anchorage to incorporate additional data collection for evaluation of IFR services delivered via the Capstone system. The University's original evaluation contract did not cover this subject. The contract add-on is for the gathering of data to include interviews with approximately 100 pilots twice each year of the demonstration, during summer and winter seasons.

*Conduct Safety and Human Factors Study - cont.*

**Progress/Outcomes - cont.**

C. Conduct Study – cont.

**Progress 4<sup>th</sup> Quarter FY00: - In Progress**

The University of Alaska Anchorage Aviation technology has traveled to the Capstone area and conducted Pilot/Operator interviews for equipment usability and feedback surveys. The information gathered has been forwarded to the appropriate agencies for analysis and an initial report has been published.

**Progress 1<sup>st</sup> Quarter FY01: - In Progress**

The University of Alaska Anchorage Aviation Technology and ISER (Institute for Social and Economic Research) produced the first Capstone Program Safety Office Annual Report (draft) in December 2000.